

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

Claim 1 (cancelled)

2. (Currently Amended) A membrane according to claim 21 4, wherein the anionic or anionizable groups of the polyacrylonitrile are selected from sulphonic, phosphonic, carboxylic, sulphuric, phosphoric groups and from salts of the aforementioned groups.

3. (Currently Amended) A membrane according to claim 21 4, wherein the anionic or anionizable groups of the polyacrylonitrile are acid sulphonic groups or salified sulphonic groups.

4. (Currently Amended) A membrane according to claim 3, wherein the semipermeable support membrane consists essentially of a copolymer of acrylonitrile and sodium methallyl sulphonate.

5. (Currently Amended) A membrane according to claim 21 4, wherein the cationic polymer is a polyamine.

6. (Currently Amended) A membrane according to claim 5, wherein the cationic polymer is a polyethyleneimine.

7. (Currently Amended) A membrane according to claim 6, wherein the amount of polyethyleneimine deposited is between approximately 1 mg and approximately 30 mg per m² of membrane (including end points).

8. (Currently Amended) A membrane according to claim 21 4, wherein the cationic polymer is prepared by ultrafiltration using a semipermeable membrane which

is identical to the semipermeable support ~~membrane~~ base layer or which has a cut-off threshold equal to or greater than that of the semipermeable support ~~membrane~~ base layer, in order to preclude said chains of the cationic polymer from penetrating into said pores of the support base layer ~~exclude the chains of the cationic polymer capable of passing through the semipermeable support membrane.~~

9. (Currently Amended) A membrane according to claim 21 4, wherein the anticoagulant agent carrying anionic groups belongs to the family of glycoaminoglycans having an anticoagulant activity.

10. (Currently Amended) A membrane according to claim 9, wherein the anticoagulant agent essentially consists of heparin.

11. (Currently Amended) A membrane according to claim 10, wherein the amount of anticoagulant agent deposited is between approximately 200 IU and approximately 20,000 IU per m² of membrane (including end points).

12. (Currently Amended) An exchanger for treating blood or plasma by extracorporeal circulation, comprising two compartments separated by a semipermeable membrane having a surface oriented towards a first compartment intended for the circulation of blood or plasma, wherein the semipermeable membrane is a composite semipermeable membrane according to one of Claims 2 to 11, or 21 4 to 44, and in that the surface of the membrane oriented towards the first compartment is coated successively with a first coated layer having a cationic polymer and with a second coated layer having an anionic anticoagulant agent.

13. (Currently Amended) An exchanger according to claim 12, wherein the composite semipermeable membrane is a flat membrane.

14. (Currently Amended) An exchanger according to claim 12, wherein the composite semipermeable membrane consists of a bundle of hollow fibres.

15. (Currently Amended) A method for reducing the thrombogenic character of an exchanger for treating blood or plasma by extracorporeal circulation, comprising two compartments separated by a semipermeable membrane having a surface oriented towards a first compartment intended for the circulation of blood or plasma, the method comprising:

(a) preparing a semipermeable membrane having pores, in the form of a flat membrane or a bundle of hollow fibres, from a solution of polyacrylonitrile carrying anionic or anionizable groups;

(b) ~~assembling the various components of the exchanger, in particular~~ fitting the semipermeable membrane or a bundle of hollow fibres in a case;

(c) preparing a solution containing at least one cationic polymer carrying cationic groups ~~which are capable of forming an~~ that form ionic ~~bond~~ bonds with the anionic or anionizable groups of the polyacrylonitrile, the cationic polymer further comprising only polymer chains whose size is sufficient for the chains not to ~~pass through~~ penetrate into the pores of the semipermeable membrane, and bringing this solution into contact with the surface of the semipermeable membrane intended to be placed in contact with the blood or plasma, stage (c) being carried out before or after stage (b);

(d) in the event that stage (c) is carried out ~~subsequently to~~ after stage (b), purging the exchanger of the solution containing the cationic polymer;

(e) preparing a solution containing, in the dissolved state, at least one anticoagulant agent carrying anionic groups ~~which are capable of forming an~~ that form ionic bond bonds with the cationic groups of the said cationic polymer, and bringing this solution into contact with the surface of the semipermeable membrane intended to be placed in contact with the blood, stage (e) being implemented after stage (c) but before or after stage (b); and

(f) in the event that stage (e) is carried out ~~subsequently to~~ after stage (b), purging the exchanger of the solution containing the anticoagulant agent.

16. (Currently Amended) A method according to claim 15, wherein the semipermeable membrane is rinsed in order to remove the excess unbound cationic polymer, either after stage (c) when stage (c) is carried out before stage (b), or after stage (d).

17. (Currently Amended) A method according to claim 15, wherein the semipermeable membrane is rinsed in order to remove the excess unbound anticoagulant agent, either after stage (e) when stage (e) is carried out before stage (b), or after stage (f).

18. (Currently Amended) A method according to one of claims ~~claim~~ 15, 16 or 17, wherein the exchanger is sterilized ~~when~~ following the coating of the semipermeable membrane ~~based on polyacrylonitrile carrying anionic or anionizable groups is coated with the cationic polymer,~~ said sterilization being completed before coating the semipermeable membrane with ~~then a treatment using a solution containing at least one anticoagulant agent is performed extemporaneously.~~

19. (Currently Amended) A method according to one of claims claim 15, 16 or 17, wherein the exchanger is sterilized ~~when~~ following the coating of the semipermeable membrane ~~based on polyacrylonitrile carrying anionic or anionizable groups is coated~~ first with the cationic polymer and then with the anticoagulant agent.

20. (Currently Amended) A method according to claim 15, wherein the cationic polymer is prepared by ultrafiltration using a semipermeable membrane which is identical to the semipermeable support membrane or which has a cut-off threshold equal to or greater than that of the semipermeable support membrane, in order to exclude the cationic polymer chains capable of passing through the semipermeable support membrane.

21. (New) A composite semipermeable membrane comprising:
a semipermeable support base layer having pores and further comprising polyacrylonitrile and at least one anionic or anionizable group;
a first coated layer having a cationic polymer carrying cationic groups that form ionic bonds with said anionic or anionizable groups of the support base layer, said cationic polymer further comprising chains having an associated steric hindrance that prevents said chains from penetrating into said pores of the support base layer; and
a second coated layer provided on the first coated layer, said second coated layer having an anticoagulant agent carrying anionic groups that form ionic bonds with the cationic groups of the first coated layer.

22. (New) A membrane according to claim 21, wherein said anionic groups avoid contact with the semipermeable support base layer.

23. (New) A method according to claim 18, wherein said sterilization includes sterilizing the semipermeable membrane with gamma irradiation or with ethylene oxide.

24. (New) A method according to claim 19, wherein said sterilization includes sterilizing the semipermeable membrane with gamma irradiation or with ethylene oxide.

25. (New) A method for preparing a composite semipermeable membrane comprising the consecutive steps of:

coating a semipermeable support base layer having pores with a first layer having a cationic polymer including cationic groups that form ionic bonds with said anionic or anionizable groups of the support base layer, said cationic polymer further comprising chains having an associated steric hindrance that prevents said chains from penetrating into said pores of the support base layer; and

coating the first layer with a second layer, said second layer having an anticoagulant agent having anionic groups that form ionic bonds with the cationic groups of the first layer.